Hard Decisions Require the Right Choices[1]

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本稿は，アメリカ土木学会（以下，ASCEと表記）のASCE News 2000年6月号に掲載されたDelon Hampton ASCE会長（当時）による記事の全文である．同記事中で，Hampton氏はアメリカにおける土木技術者の社会的地位の低下について懸念しており，その解決への方策について述べている．その内容は，本誌の読者に対しても大いに示唆に富んだものであると考えられる．なお，ASCEとJSCEは1988年より協力協定を締結しており，本稿は同協定に基づきASCEより記事転載の許可を得て，掲載したものである．

抄訳：近年，アメリカにおける土木技術者の社会的地位および報酬は低下しており，ASCE会員の間でも，最も懸念されるところである．現状の土木界が抱える問題点としては，土木教育レベルの低下と土木エンジニアが社会においてリーダーシップを発揮していないという2点が挙げられる．教育問題については，修士号を技術資格の受験資格とするとともに，エンジニアの継続的な教育を行い最新の知識を習得させるべきである．さらに，土木界から社会に有能なリーダーを輩出し，社会的，政治的な影響力を高めていく必要があると考える．そのために，われわれは正しい選択を行わなければならず，土木エンジニアの将来は，まさにわれわれの決断にかかっている．

According to ASCE's latest poll of its membership, the principal concerns are the image and stature of the civil engineer and compensation. This has been corroborated in discussions at our zonal management and leadership conferences. The big question is, What are we going to do about it?

The image and stature of the engineer in this country, which are directly related to the compensation, have been on the decline for some time. They probably were at their peak during the lives of John and Washington Roebling, according to Samuel Florman, a civil engineer and author of several books on the engineering profession. In an article entitled "Why Can't We Be Better Than We Are?" adapted from his address at the 1984 national convention of Tau Beta Pi, Florman writes, "The vast majority of American engineers have gone through a four-year college program taking a handful of liberal arts courses, most of these in the so-called useful social sciences. Their experience with literature, history, philosophy, and the fine arts stopped, to all intents and purposes, when they left high school."

"Less than a third of America's engineering graduates," Florman continues, "go on to take a master's degree. Only an infinitesimal five percent study for the doctorate. Less than half take the trouble to earn a professional engineer license in the state in which they practice. Perhaps most shocking of all, less than half bother to join a single professional society. And, although I will not bore you with any statistics on this, not nearly enough are active in politics or community affairs – not nearly enough are leaders, although we are said to live in a technological age. This is a portrait of a profession in decline."

I agree, today, with Florman's assessment of 16 years ago. His statement also defines for us what needs to be done to attain the image, stature, and compensation we covet and deserve. Again, the question remains as to our willingness to make the hard decisions necessary to elevate our profession.

Let us discuss our weaknesses in light of Florman's statement.

Education. Education of the engineer is too limited for the 21st century. Our educational system has not changed in over 100 years, other than to become easier. We have not kept our undergraduate engineering curricula abreast of the changes in new knowledge in science and technology and the need for engineers to develop leadership traits. If we want to be considered among the top professions, we must stiffen our educational requirements and, at the same time, broaden the education of the engineer.

According to S.G. Walesh in his article "Engineering a New Education," there are approximately twice as many colleges of engineering as there are schools of engineering

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technology, and he claims that the proportion should be reversed. Walesh also claims that "becoming a civil engineer is too easy, and it's getting easier – if the current movement to further reduce course credit requirements is any indication." He is supported in his opinion by S. Rojstaczer, who in his book "Gone for Good" writes, "Given that we have both reduced class hours and lowered our standards for student performance, students here today are working significantly less than the students in the 1960s."

The more prestigious professions control the number of new entrants, which enhances their image, stature, and compensation level. We must do the same if we are to enhance our profession and ensure that future engineers are adequately trained for the practice of tomorrow and can perform in such a manner as to protect public health, safety, and welfare. Adopting the master's degree as the first professional degree and making it a requirement to sit for the engineering licensing examinations will accomplish this goal. Walesh further states, "Civil engineering is losing a lot of talent because in many cases students are not being exposed to the creative, people-serving dimensions of the profession. Keep in mind, though, that when I say 'losing talent' I mean losing quality, not quantity."

We must begin mandatory continuing professional development for the reasons previously cited. Our knowledge base is expanding rapidly. The half-life of an engineering degree is estimated to be less than four years. As a profession we have a legal, as well as a moral, responsibility to ensure that our members are current in their knowledge base.

In his paper "Future of Civil Engineering Profession and Role of Education," Ross B. Carotis states, "As a start, it is proposed that the civil engineering profession seek further means to differentiate clearly [between] high-tech engineers, more general civil engineering practice, and applied technology."

Leadership. Engineers must regain their former leadership role in society. The great engineers of the past were all strong leaders – Telford, Stephenson, Wright, Roebling – but the great preponderance of engineers today are "too busy" to assume leadership roles in their communities, at the state level, or nationally. As a result, our voices are absent during serious debate on engineering and technology issues related to public health, safety, and welfare. We are generally not at the table when key decisions affecting our profession and public health, safety, and welfare are being made.

There are, at most, 4 members of the 535-member U.S. Congress who list themselves as engineers. There are very few state, city, or county legislators who are engineers, and in our local communities we generally do not take our rightful places on boards, commissions, and councils. As a result, the public does not recognize engineers as leaders. Our failure to participate in public affairs is the main reason people view us as followers rather than leaders. This, along with the fact that "there are simply too many of us out there," as stated by S.G Walesh in his paper "Engineering a New Education," contributes to the lack of prestige and the relatively low salary levels of engineers.

Our profession is on the path to becoming a commodity – services provided solely on the basis of the cheapest price. We must force change or others will force it upon us, and we might not like the results.

As an illustration of our precarious situation, let us look at the public sector. At one time all heads of state transportation and public works agencies were engineers. Now there are only 14, according to Thomas Warne, head of the Utah Department of Transportation. At one time most departments of public works at the state and the local level were headed by engineers. Now there are relatively few. At one time all the engineering bureaus of the city of Chicago were headed by engineers. Now, according to Donald Eckman, none are. At the national level, practically all the policy positions with oversight of engineering functions are occupied by non-engineers.

"The world is run by those who show up," says Richard G.Weingardt, and we are not showing up in sufficient numbers to make a difference. That is why the public perceives engineers as doers, not leaders or managers. "The great leaders are highly visible. Their followers know where to find them and what they stand for," says Weingardt.

If our profession is to rank among the top in the world, we must do a better job of developing leaders. We must preside over a paradigm shift to make our profession stronger. This will involve stiffer academic and continuing education requirements and a greater willingness on our part to assume leadership roles in all aspects of our lives. It will also mean greater involvement in the political process – both as candidates for elective and appointive office and as strong supporters of candidates – and a determination to take our skills to the next level by becoming active in professional and technical societies. If we are not willing to do these things, then our profession will continue on the road toward becoming a commodity. That would do little for our image and stature and for our claim to increased compensation.

Engineering has been very good to my generation. It has provided us the opportunity to achieve the American dream for our families, to travel the world, to design and build structures that will be here long after we are gone, to make wonderful, lifelong friends, and to be honored by our peers. My greatest fear is that we will be too timid to make the hard decisions necessary to ensure that our profession will remain one of the world's best. Without firm resolve, our profession will continue to diminish in stature.

The future is in our hands, and for the sake of our successors I hope we make the right choices.